

IODINE

Revised December 8, 1997

SCOPE: This guideline applies to all potential exposures to iodine at Defense Logistics Agency/Defense National Stockpile Center (DLA/DNSC) Depots, their satellite locations, and any military locations storing this material for the DLA/DNSC.

RESPONSIBILITY: It shall be the responsibility of the DLA/DNSC Safety and Health Manager to institute and monitor the procedures outlined in this guideline in order to insure that the safety and health of all authorized personnel engaged in visiting, inspecting, handling, storing, and outloading iodine from stockpile locations is maintained.

SHORT TERM EXPOSURE LIMIT: The Department of Labor, Occupational Safety and Health Administration (OSHA) has established a Ceiling Limit for iodine in the workplace. No employee shall be exposed to airborne concentrations of iodine in excess of 0.1 parts per million (ppm) or 1 milligram per cubic meter of air (mg/m³), as a 15 minute time weighted average (TWA). This limit shall not be exceeded anytime during the workday.

DNSC ACTION LEVEL: Airborne iodine concentrations in excess of 0.05 parts per million or 0.5 mg/m³, as a 15 minute ceiling limit, when measured at the approximate breathing zone of a worker, using a direct reading instrument (MAST Iodine Meter), shall constitute a condition necessary to implement full personal protection and monitoring procedures.

NOTE: Regardless of airborne levels of iodine, skin contact with iodine (crystals and flakes) shall not be permitted. All necessary steps shall be taken to protect personnel engaged in stockpile operational activities from incidental skin contact.

ADMINISTRATIVE CONTROLS: DNSC management shall utilize all the administrative controls necessary to maintain employee exposure to a minimum. Administrative controls are controls such as, but not limited to, reduction in number of hours personnel may be exposed during a specific work shift and employee rotation to prevent excessive and repeated potential exposures.

ENGINEERING CONTROLS: DNSC management shall utilize all the engineering controls at their disposal to ensure DNSC employees and other persons involved in DNSC work related activities in and around areas where iodine is stored are not exposed to airborne concentrations of iodine vapor in excess of the OSHA established Ceiling Limit. Engineering controls are controls such as, but not limited to, isolation, enclosure, local exhaust ventilation, rejarring, containment, and/or overpackaging used to contain iodine and prevent it from entering the environment.

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Where engineering or administrative controls are not feasible to reduce and maintain iodine levels below 0.05ppm or 0.5mg/m³ personal protective equipment, including respiratory protection shall be worn.

Some of the engineering controls utilized to reduce airborne concentrations of iodine at DNSC locations may include, but shall not be limited to:

- a. Rehabilitation of caps, jars, and cardboard packaging.
- b. Decontamination of space and materials contaminated by iodine.
- c. Use of portable local exhaust ventilation positioned at work locations where the concentration of airborne iodine vapors may be generated.
- d. Inspection of iodine jars and packaging at least annually to ensure that all necessary steps are being taken to reduce the potential for release of iodine into the general work environment.

RESPIRATORY PROTECTION PROGRAM

The selection, use, and proper maintenance of respirators shall be in accordance with 29 CFR 1910.134, and the DNSC Respiratory Protection Program. All respirators used shall be approved by the National Institute of Occupational Safety and Health (NIOSH) for the purpose and concentrations intended.

All persons entering areas where iodine is stored, shall wear, as a minimum, a full facepiece dual cartridge respirator with organic vapor cartridges with a high efficiency particulate air filter (HEPA), if monitored levels within the area are in excess of the DNSC action level of 0.05 ppm or 0.5 mg/m³ but less than 0.1 ppm or 1.0 mg/m³. If less than the DNSC Action Level no respiratory protection is warranted.

Airborne concentrations of iodine in excess of 0.1 ppm or 1.0 mg/m³, only air supplied respirators or self contained breathing apparatus (SCBA) shall be permitted.

NOTE: As airborne concentrations of iodine elevate so does the level of respiratory protection. NIOSH criteria documents and respiratory guidelines will dictate the type of respirators needed for the concentrations of iodine found.

Work tasks, other than inspections and visiting walk-throughs, which require use of respirators and some form of physical exertion on the part of the worker shall be assigned only to those DNSC employees who have been examined by a licensed physician. The purpose of this examination is to determine that the person is capable of performing the duties assigned, while wearing restrictive type respiratory protection without potential for impairment to their health.

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PERSONAL PROTECTIVE CLOTHING

Personal protective clothing shall be worn by all DNSC personnel and other persons, if in the judgment of the Safety and Health Manager or their designee there is a reasonable potential for physical contact with iodine, or the documented airborne concentration within the iodine storage area exceeds the DNSC action level.

The "protective clothing" shall consist of whole-body covering, gloves, and head and foot covering. Clothing and gloves shall be the type that will be impervious to the penetration or absorption of iodine. (See Enclosure 3)

CHANGE ROOMS AND CLOTHING LOCKERS

At all DNSC iodine storage locations, change rooms or similarly designated areas which include areas for changing clothes, washing and showering shall be made available. It is recommended that the use of showers at these facilities be dependent upon the type of personal exposure an individual has received during the course of the workday. Requirements for their use shall be based on the exposure concentrations and the extent of exposure, as determined by workplace monitoring during the work shift.

Disposable clothing contaminated with iodine and used iodine respirator cartridges, shall be disposed of in a polyethylene bag, properly sealed and labeled for proper disposal.

METHODS OF MEASUREMENT

Determination of airborne concentrations of iodine shall be made using the methods described in the manufactures instruction for the monitoring equipment.

All equipment used for monitoring iodine at DNSC facilities and their satellites shall be properly calibrated prior to use.

ENVIRONMENTAL

An initial determination of airborne concentration of iodine vapor shall be made using a portable iodine vapor monitor or equivalent, prior to conducting operational activities in DNSC iodine storage areas. If levels are found in excess of the DNSC action level, the storage area(s) shall be thoroughly aired prior to commencement of operational activities. The information gathered during this initial survey shall dictate what administrative and/or engineering controls are necessary and what the level of personal protection is needed to protect workers and the environment.

Periodic area sampling for airborne concentrations of iodine shall be conducted on an annual basis, preferably during the warm summer months. Monitoring shall also be performed during the recapping or overpackaging of iodine to establish a baseline for

potential exposures during these operations. The results of this initial iodine monitoring will establish the procedures and equipment necessary to protect DNSC employees and the environment.

PERSONAL

Personal monitoring shall be required during any iodine work activity where environmental samples indicate airborne concentrations of iodine are in excess of the DNSC action level. Personal samples shall be collected at the breathing zone of all workers.

NOTE: Additional sampling methods may be employed at the direction of the DNSC Industrial Hygienist based on the work to be performed and the potential for worker exposure.

OBSERVATION OF MONITORING AND ACCESS TO RECORDS

DNSC, other Federal employees and contract personnel (if it relates to iodine vapor monitoring during a time period when any of the above persons were in DNSC iodine storage areas for any legitimate reason while sampling was being conducted) shall have the reasonable opportunity to observe any monitoring and have access to their monitoring results and records.

CAUTION SIGNS AND LABELS

“Caution” signs shall be posted outside the entrance to ALL DNSC iodine storage area. “Caution” labels shall also be used to identify the contents of reclaimed iodine and contaminated waste of iodine.

1. Caution signs must state:

CAUTION
IODINE
AUTHORIZED PERSONNEL ONLY
In case of Fire Enter only in Self Contained Breathing Apparatus

2. Caution Labels must state:

“CAUTION”
IODINE CONTAMINATED WASTE

HOUSEKEEPING, SPILLS, AND DECONTAMINATION

All iodine storage areas shall be inspected at least annually. If iodine is accidentally released to the warehouse, immediately isolate the area and notify DNSC-MH for cleanup and specific instructions. (See Enclosure 1)

WASTE DISPOSAL

All waste iodine or materials contaminated with iodine shall be disposed of in a manner and at a location approved by the EPA, and State environmental authorities. DLA/DRMS may also be used for this disposal action, if appropriate.

TRAINING

All DNSC employees shall be trained in the hazards presented by iodine and the contents of this guideline (See Enclosure 2).

RECORDKEEPING

All environmental and personal monitoring exposure records shall be maintained by DNSC for a period of at least 20 years. One copy shall be kept on file at the respective DNSC depot office and one copy in the DNSC Safety office.

DNSC, other Federal employees, and other persons shall have access to any records of environmental or personal monitoring that are directly related to their exposure. Any DNSC, other Federal, and when applicable, other persons who have been exposed to iodine in excess of OSHA established STEL shall be notified in writing within five days of the finding.

MEDICAL EXAMINATIONS

Medical examinations shall be provided for all DNSC employees potentially exposed to iodine. Such examinations shall be on an annual basis or more frequently if medically indicated.

MEDICAL RECORDS

A copy of all medical records relating to iodine exposure preplacement, annual, and termination of employee medical examinations shall be maintained for at least 20 years.

ACCESS

The content of all medical, iodine exposure and related documents shall be made available to only those parties who are authorized under existing Federal regulations.

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ENCLOSURE 1

SPILLS AND DECONTAMINATION

The following emergency procedures shall be observed when cleaning and decontaminating areas where iodine has been spilled. The environmental conditions existing at the time of the spill will dictate the exact manner in which a spill is cleaned up. Specific procedures and methods for cleanup will be determined by the Directorate of Strategic Materials Management, Safety and Health Staff, DNSC-MH.

1. Clear all personnel from the general area of the spill. Only authorized personnel, designated as part of the cleanup and decontamination operation shall be allowed in the area of the spill during cleanup and/or decontamination.
2. Ensure that it is understood that eating, drinking, chewing or smoking is strictly prohibited in any iodine storage area, and that the washing of exposed skin i.e. hands, face, and neck are required prior to smoke breaks, lunch breaks and that showers are required at the end of the shift.
3. Put on all necessary personal protective clothing, including respiratory protection, disposable coveralls including headgear (hoods), gloves and rubber boots.
4. Prior to entrance by personnel to conduct cleanup activities, open warehouse storage doors to disperse (airing) accumulated vapors. It may also be necessary to provide portable local exhaust ventilation to reduce the levels of iodine to workable levels.
5. During the "airing" procedure, the air should be monitored to determine the airborne concentration of iodine using a calibrated IODINE direct reading monitor. Airborne concentration of iodine dictate which type of respiratory protection is necessary to protect workers. If airborne concentrations of iodine are in excess of 1.0 mg/m³, or 0.1 ppm after the area has been thoroughly aired, only supplied air or self-contained breathing apparatus can be used. If this situation occurs, contact DNSC-MH immediately for further procedures and instructions.
6. Cleanup operations shall be conducted in a manner that will minimize and limit the amount of contamination to the protective clothing, equipment, and to the storage area and other materials contained therein.
7. After completing the cleanup, decontamination, or at the end of the work shift, whichever comes first, all iodine waste, such as disposable personal protective clothing, and other contaminated debris shall be placed in a covered, lined, and properly labeled as a hazardous waste container.
8. Personnel directly engaged in the cleanup and decontamination operation shall thoroughly wash and shower at the end of the shift.
9. Dispose of the accumulated iodine contaminated material in a manner and at a location approved by the Environmental Protection Agency (EPA). DLA/DRMS may be used for this disposal action.

NOTE: Exact details of sampling, decontamination and disposal procedures in conjunction with any DNSC decontamination operation shall be developed and carefully

delineated by the Directorate of Strategic Materials Management, Safety and Health Staff (DNSC-MH). DNSC-MH shall determine the sampling, decontamination, and disposal options best suited for the specific situation since each spill and cleanup operation is different.

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ENCLOSURE 2

TRAINING

The DNSC Safety and Health Manager shall establish a training program to instruct DNSC personnel, other Federal agencies and other persons, when necessary, of the potential health hazards involved in the handling, storage, and outloading of stockpile iodine. Information covered should include, but should not be limited to, the parameters listed below.

1. Inform personnel of correct work and storage practices, emergency procedures to be followed in case of spills, leaks, or fire and, personal protective equipment requirements.

2. Discuss with personnel the signs and symptoms of overexposure to iodine and instruct them to immediately notify the DNSC-MH safety staff should they develop any symptoms.

3. Instruct personnel in the DNSC operations which could result in exposure to iodine above DNSC action levels, as well as safe work practices for the handling, use, storage, or disposal of iodine in normal and emergency operational activities.

4. Educate personnel in the proper housekeeping practices, decontamination procedures in the event of a iodine spill, and

5. Instruct personnel in the measures necessary to protect them from excessive exposures to iodine, such as limiting the time of exposure, the use of engineering controls (such as portable exhaust ventilation), and the wearing of proper and approved personal protective clothing, respirators, and equipment.

6. Instruct personnel as to the purpose, proper use, maintenance, and limitations of their respirators and personal protective equipment.

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ENCLOSURE 3

PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

Where protective clothing is required in this program, or under 29 CFR 1910.132, the Depot Manager shall provide and ensure that all DNSC employees wear appropriate protective clothing, such as, but not limited to, coveralls, smocks, aprons, gloves, boots, head covering, and respirators.

1. DNSC employees shall ensure that protective clothing contaminated by iodine is discarded in a manner that will not introduce the contaminant(s) into the warehouse and surrounding environment. All protective clothing shall be removed by DNSC personnel in designated areas and deposited in properly labeled lined and covered waste containers.

2. Street clothing and street footwear will not be permitted in the workplace whenever airborne iodine concentrations exceed the OSHA Ceiling Limit, or potential contact with iodine exists. Contaminated clothing or footwear shall not leave the worksite except for disposal.

3. If protective clothing and footwear is provided for a longer period or use, they should be stored separately from personal street clothing, street footwear, food, tobacco products, and other personal effects.

4. Shower facilities shall be provided and used prior to changing into street clothes.

5. Work and street clothes shall not be stored in the same area.

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